APPENDIX J

Threatened Flora Assessment of Seismic Survey Lines in the Midlands and Central Highlands of Tasmania by Philip Barker

THREATENED FLORA ASSESSMENT OF SEISMIC SURVEY LINES IN THE MIDLANDS AND CENTRAL HIGHLANDS OF TASMANIA

FOR

GREAT SOUTH LAND MINERALS LIMITED

PHILIP BARKER

JUNE 2001

SUMMARY

A plan of a proposed seismic survey was presented to the Tasmanian Department of Primary Industry Water and Environment (DPIWE). Areas recommended to be assessed for the possibility of impacts on threatened flora were marked on the seismic survey plan. All areas were visited in the field and recommendations to ameliorate the potential impacts were adopted by GSLM. The modified seismic survey plan that was undertaken is unlikely to have had any impact on threatened flora listed on the *EPBC Act* 1999 or the *TSPA* 1995. The company committed to avoiding potential issues by using the road surface for the surveys thus avoiding habitats in road reserves. The remnant native vegetation that was traversed by the survey was searched and no threatened species was found in the vicinity of the seismic survey points.

CONTENTS

1. INTRODUCTION

1.1 BACKGROUND

Great South Land Minerals Limited (GSLM) proposed to undertake a seismic survey in search of potential oil and gas reserves in the midlands and a smaller area in the central highlands of Tasmania. GSLM referred the proposal to the Commonwealth government for consideration pursuant to the *Environmental Protection and Biodiversity Conservation Act* 1999 (EPBC). The Minister deemed that the action is not a controlled action and so approval under the EPBC Act is therefore not required. The Minister, however, reiterated the need for a permit if listed plants were to be effected.

The GSLM proposal committed the company to having the survey line assessed by a botanist at sites where there are known records of threatened species, listed on the EPBC Act schedule.

GSLM committed to the same for threatened flora species listed on the *Threatened Species Protection Act* 1995 (Tasmania).

This report presents the outcome of those surveys and the means by which potential effects were avoided.

1.2 SURVEY LINES

Forty nine survey lines were proposed totalling over 1 000 km. Twenty nine lines (600 km) were located in the northern midlands from Campbelltown to Westbury and along the Tunbridge tier road and twenty in the central highlands. The survey lines were pegged at intervals of 25 m. The seismic survey was to be undertaken at these 25 m intervals.

1.3 LIMITATIONS

The survey was undertaken in March and May. It should be noted that no plant survey can guarantee that all vascular flora will be recorded during a single visit due to seasonal and annual variation in abundance and the possible absence of fertile material for identification. Ephemeral species that may have been overlooked include spring flowering orchids. However, all significant species known to occur in the vicinity of the study area are considered.

2. BOTANICAL SURVEY

2.1 BACKGROUND RESEARCH

The following databases were accessed for biological records from the region:

The GTSpot database of the Department of Primary Industries, Water and Environment and the State Herbarium database were searched for records of species listed on the *Threatened Species Protection Act 1995* (TSPA)

and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) occurring within the extent of occurrence of the proposed seismic survey. As the accuracy of these databases varies from within approximately 100 m to 10 000 m, records identified in relation to the proposed survey lines may not be actually near the lines. Some records may be or are known to be unreliable. Furthermore, the database only contains records of known threatened species and does not imply that all sites of such species are recorded or contained in the database.

The threatened flora records were plotted on maps with the proposed survey lines. The Threatened Species Unit (DPIWE) identified areas that were of concern and indicated where survey was required (Appendix 4).

2.2 Botanical Survey

The threatened flora survey was undertaken after the seismic survey lines had been pegged. The lines were investigated thoroughly so that all potential habitats were searched. Appendix 4 (folded map at back cover) shows the location of the proposed seismic survey lines and threatened species records.

Botanical nomenclature follows the current Census of Tasmanian plants [1].

2.3 Assessment of Conservation Significance

Methods of assessing conservation significance of flora species have been developed and are detailed in Appendices 1 and 2. The conservation significance of species are determined at a state and federal level by legislation (*Threatened Species Protection Act 1995, Environment Protection and Biodiversity Conservation Act 1999*).

3. THE THREATENED FLORA VALUES

3.1 The threatened Species

Appendix 3 lists the species that were returned during the database search.

3.2 Remnant surveys

Appendix 4 indicates remnant native vegetation with recorded threatened flora that the survey line past through and were recommended by DPIWE for assessment. Each remnant was visited to determine if threatened species existed at proposed seismic survey points.

[1] Buchanan, 1999

4. AMELIORATION OF POTENTIAL IMPACT

Where possible the seismic survey was undertaken along roads. Many of the threatened species records are located in road reserves. Due to the potential impact on these sites ALL seismic survey was undertaken by locating the sensors in the roadside habitat and applying the vibration plates (potential impact) to the road surface thus avoiding ALL potential impacts upon any species in the road reserve. Appendix 5 indicates the final location of the survey lines. In comparison to Appendix 4 the effect of the amelioration strategy on the location of the survey lines can be seen.

Some survey lines crossed agricultural land. Most of the land traversed by the survey supports introduced pasture with no threatened species records. Where the survey lines passed through native remnant vegetation with records of threatened species in the vicinity the remnants were searched for threatened species at the 25 m seismic data points along the survey line. These sites are indicated in Appendix 4. Of the lines that passed through remnants with records of threatened flora four were relocated and avoided the habitat completely. No threatened flora were found at two of the remaining sites while *Brunonia australis* was found at one site (Table 1.)

At site 5 *Brunonia australis* was scattered in occasional patches of 5 – 10 m diameter in the vicinity of the proposed survey line and an adjacent area of 1-2 ha. However, no *B. australis* occurred at seismic survey points and no impact would be expected on any plants.

Table 1. Remnant number, survey line and the outcome of survey, See Appendix 4.

Remnant	Line	Outcome
1.	SE	Alignment changed remnant avoided
2.	PW	Alignment changed remnant avoided
3	PE	Semi native understorey, no threatened species found
4	PF	Alignment changed remnant avoided
5	PF	Inland amygdalina forest, Brunonia australis present but none at survey points.
6	PT	Alignment changed remnant avoided
6	PR	Inland amygdalina forest no threatened species found at survey points.

5. CONCLUSION

All sites recommended for assessment by DPIWE were visited. All roadside surveys avoided potential impacts on threatened species by avoiding any physical disturbance of the potential habitats by undertaking the seismic survey from the road surface. The remnant habitat surveys indicate that there is not likely to be any impact at those sites where threatened species have been recorded in the vicinity. No threatened species were found in the vicinity of the survey points.

References

Buchanan, A.M. (1999). *A Census of the Vascular Plants of Tasmania & Index to The Student's Flora of Tasmania*. Third Edition. Tasmanian Herbarium Occasional Publication No. 6, Hobart.

CARSAG (2000). Forest conservation priorities for use outside of CARSAG and the RFA Private Land Reserve Program. Unpublished report.

Commonwealth of Australia & State of Tasmania (1997). *Tasmanian Regional Forest Agreement.*

Commonwealth of Australia (1999). *Environment Protection and Biodiversity Conservation Act 1999. No. 91, 1999*

Flora Advisory Committee (1994). *Native Higher Plant Taxa Which Are Rare Or Threatened In Tasmania*. Parks & Wildlife Service, Hobart.

Goff, F.G, Dawson, G.A. and Rochow, J.J. (1982). Site examination for threatened and endangered plant species. *Environmental Management 6 (4) pp 307-316*.

Kirkpatrick, J.B., Barker, P., Brown, M.J., Harris, S., and Mackie, R. (1995). *The Reservation Status of Tasmanian Vascular Plant Communities*. Wildlife Scientific Report 95/4. Parks and Wildlife Service, Hobart.

North, A.J., Johnson, K., Ziegler, K., Duncan, F., Hopkins, K, Ziegeler, D., Watts, S. (1998). *Flora of Recommended Areas for Protection and Forest Reserves in Tasmania*. Forestry Tasmania / Forest Practices Board / Parks & Wildlife Service, Hobart.

Tasmanian State Government (1995). *Threatened Species Protection Act 1995.* No.83 of 1995. Government Printer, Hobart, Tasmania

APPENDIX 1 - DEFINITIONS OF CONSERVATION VALUES OF PLANT SPECIES

SPECIES OF NATIONAL SIGNIFICANCE

Listed in Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

The *EPBC* Act has six categories of threat status for species:

1. **Extinct -** If at a particular there is no reasonable doubt that the last member of the species has died
2. **Extinct in the wild -** If it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or If it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form
3. **Critically endangered** - If at a particular time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria
4. **Endangered** - If it is not critically endangered; and it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria
5. **Vulnerable** - If at a particular time it is not critically endangered or endangered; and it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
6. **Conservation dependent -** If, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years

SPECIES OF STATE SIGNIFICANCE

Listed in Tasmanian *Threatened Species Protection Act 1995* (TSP Act)

Threatened flora and fauna species in Tasmania are listed in Schedules 3 (extinct or endangered), 4 (vulnerable) or 5 (rare). These three categories are defined in Section 15 of the Act.

1. **Extinct** - If no occurrence of the taxon in the wild can be confirmed during the past 50 years
2. **Endangered -** If it is in danger of extinction because long-term survival is unlikely while the factors causing it to be endangered continue operating.
3. **Vulnerable** - If it is likely to become an endangered taxon while the factors causing it to be vulnerable continue operating.
4. **Rare** - If it has a small population in Tasmania that is not endangered or vulnerable but is at risk."

Species that have been nominated and approved by the Scientific Advisory Committee for listing in the Act

SPECIES OF REGIONAL OR GENERAL SIGNIFICANCE

The following definitions are from three publications: Flora Advisory Committee 1994, Vertebrate Advisory Committee 1994, Invertebrate Advisory Committee 1994

Flora only - Species listed as rare but not necessarily 'at risk' (**r3**)

Fauna only – Species requiring monitoring (**m**)

Both – Species of unknown risk status (**k**) in Tasmania, or thought to be uncommon within region, or a species having a declining range or populations within the area.

Species considered to be outside its normal range or of an unusual form as determined and justified in the body of the report.

Species identified in regional studies as being of conservation significance that are not listed in current legislation

Species that have been recognised but have not been formally described in a published journal that are thought to significant as determined and justified in the body of the report.

Plant species that are not known to be reserved. To be so it must be known to exist in at least one secure Reserve. Secure reserves include reserves and parks requiring the approval of both Houses of Parliament for their revocation. They include: National Parks, Aboriginal Sites, Historic Sites, Nature Reserves, State Reserves, Game Reserves, Forest Reserves, Wellington Park, and insecure reserves in the World Heritage Area which is protected by international agreement under the World Heritage Convention.

APPENDIX 2 - LEGISLATIVE IMPLICATIONS OF THREATENED SPECIES

Tasmanian State Legislation Affecting Threatened Species

Threatened Species Protection Act 1995

Threatened flora and fauna species in Tasmania are listed in Schedules 3 (endangered) and 4 (vulnerable) of the Threatened Species Protection Act, 1995. Rare species that are considered to be 'at risk' are listed in Schedule 5 of the Act. These three categories are defined in Section 15 of the Act.

1. "An extant taxon of native flora or fauna may be listed as **endangered** if it is in danger of extinction because long-term survival is unlikely while the factors causing it to be endangered continue operating.

2. A taxon of native flora or fauna may be listed as **vulnerable** if it is likely to become an endangered taxon while the factors causing it to be vulnerable continue operating.

3. A taxon of native flora or fauna may be listed as **rare** if it has a small population in Tasmania that is not endangered or vulnerable but is at risk."

The Act provides mechanisms for protecting these species from threatening processes the implementation of 'recovery plans', 'threat abatement plans', 'land management plans', public authority agreements', and 'interim protection orders'.

Section 51 (a) of the TSPA states that: "A person must not knowingly, without a permit - take, trade in, keep or process any listed flora or fauna". The Act defines 'take' as including: "kill, injure, catch, damage, destroy and collect. A land manager is therefore required to obtain a permit from the Tasmanian Department of Primary Industries, Water and Environment (DPIWE) to carry out management that may adversely affect any of the species listed in the Act

Commonwealth of Australia Legislation Affecting Threatened Species

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act establishes a process for assessing actions that are likely to have impacts of *national environmental significance.* Such impacts include World Heritage Areas, RAMSAR Wetland sites of international importance, migratory species protected under international agreements, nuclear actions, the Commonwealth marine environment and **nationally threatened species and communities.**

Threatened species are defined in several categories:

1. Extinct

- If at a particular there is no reasonable doubt that the last member of the species has died

2. Extinct in the wild

- If it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
- If it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form

3. Critically endangered

- If at a particular time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria

4. Endangered

- If it is not critically endangered; and it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria

5. Vulnerable

- If at a particular time it is not critically endangered or endangered; and it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

6. Conservation dependent

- If, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years

An action that is likely to affect species that are listed in any of the above categories may require ministerial approval unless the Commonwealth Environment Minister has granted an exemption. The Act establishes a **referral process** to Environment Australia to determine whether an action requires a formal **approval** and thus would be required to proceed through the **assessment and approval process**.

A referral must provide sufficient information to allow the Minister to make a decision. The Minister is then required to make a decision within 20 business days of the referral. The Minister may decide an approval is not necessary if the action is taken in a specified manner. The action may not require approval but may require a **permit** if undertaken on Commonwealth land. If an approval is required then an **environmental assessment** must be carried out. In such instances the environmental assessment approach will be determined by the Minister and may vary from preliminary documentation to a full public inquiry depending on the scale and complexity of the impact.

APPENDIX 3: THREATENED SPECIES PREVIOUSLY RECORDED IN THE VICINITY ON THE GTSPOT DATABASE.

NAME	COMMON NAME	TSPA	EPBC
Acacia axillaris	midlands mimosa	4	V
Agrostis aemula aemula	blown grass	5	
Amphibromus macrorhinus	long-nosed swamp wallaby-grass	3	
Aphelia gracilis	slender aphelia	5	
Aphelia pumilio	dwarf aphelia	5	
Asperula scoparia scoparia	prickly woodruff	5	
Batrachium trichophyllum	frogwort	5	
Baumea gunnii	slender twig-rush	5	
Bertya rosmarinifolia	bertya	4	
Bolboschoenus caldwellii	sea club-rush	5	
Brachyscome rigidula	hairy cutleaf daisy	4	
Brachyscome sieberi gunnii	sieber's daisy	5	
Brunonia australis	blue pincushion	4	
Caesia calliantha	blue grass-lily	5	
Caladenia anthracina	black-tipped spider orchid		E
Caladenia filamentosa filamentosa	daddy long-legs	5	
Caladenia lindleyana	lindley's spider orchid	5	E
Caladenia minor	minor caladenia	5	
Caladenia pallida	pale spider orchid	4	E
Callitris oblonga oblonga		4	E
Calocephalus lacteus	milky beauty-heads	5	
Calochilus imberbis	naked beard orchid	5	
Carex longebrachiata	bergalia tussock	5	
Carex tasmanica	curly sedge		V

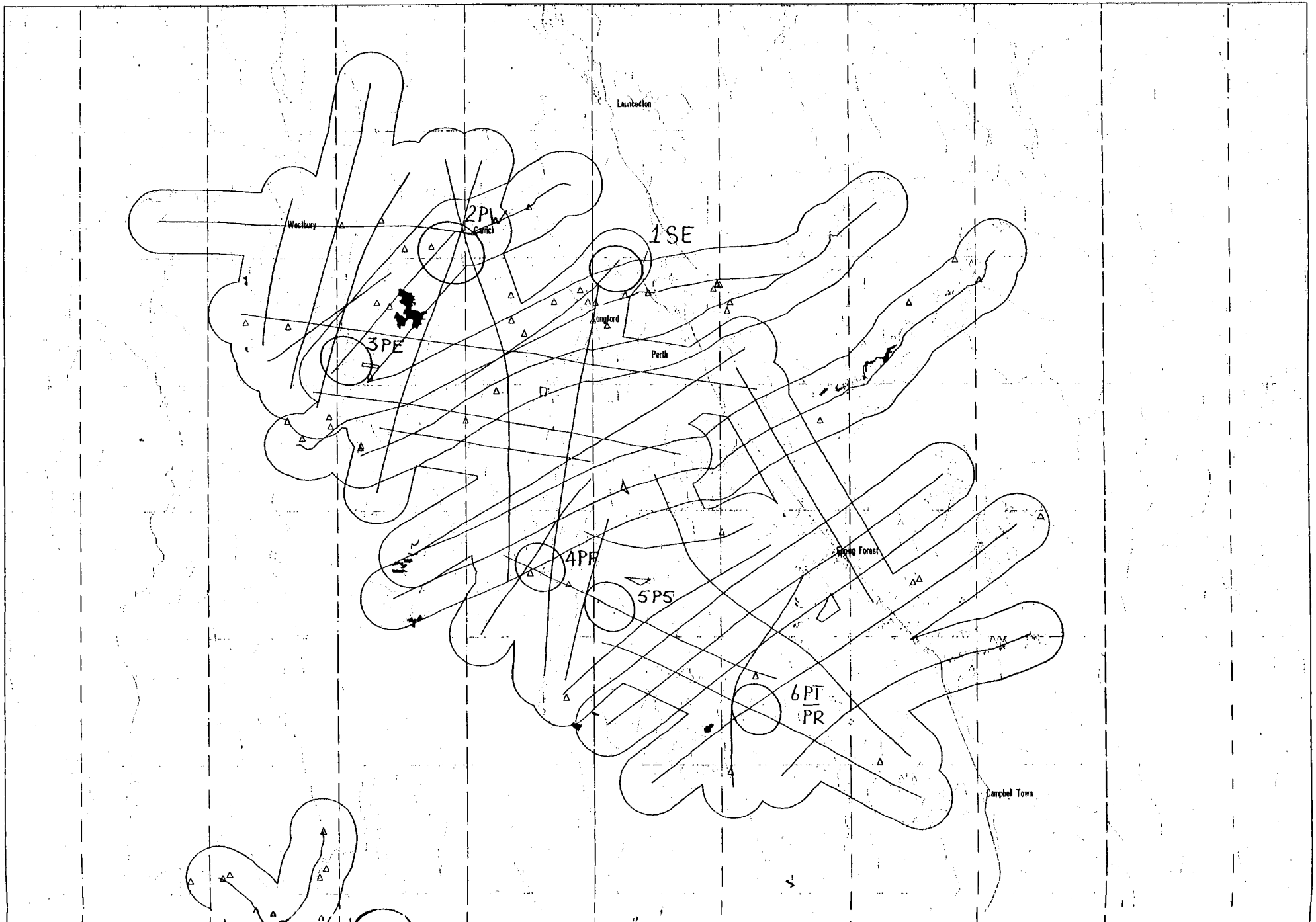
Colobanthus curtisiae	curtis' colobanth	5	E
Cryptandra amara	bitter cryptandra	3	
Danthonia popinensis	roadside wallaby-grass	3	E
Danthonia procera	tall wallaby-grass	5	
Dianella longifolia longifolia	pale or smooth flax-lily	5	
Epacris acuminata	clasping-leaf heath	4	E
Epilobium willisii	carpet willowherb	5	
Glycine latrobeana	dwarf	4	V
Haloragis heterophylla	variable raspwort	5	
Helichrysum bicolor		5	
Hyalosperma demissum	drooping hyalosperma	3	
Hydrocotyle callicarpa	tiny pennywort	5	
Isoetes elatior	tall quillwort	5	
Juncus amabilis	gentle juncus	5	
Juncus fockei	slender joint-leaf rush	5	
Juncus prismatocarpus	branching rush	5	
Lepidium hyssopifolium	peppercress	3	E
Lepidium pseudotasmanicum	peppercress	5	
Lepilaena australis	austral water-mat	5	
Leptorhynchos elongatus	lanky buttons	3	
Leucochrysum albicans tricolor	hoary sunray	3	E
Lycopus australis	native gipsywort	3.2	
Melaleuca pustulata	cranbrook paperbark	5	
Millotia tenuifolia	soft millotia	5	
Muehlenbeckia axillaris	matted lignum	5	
Myriophyllum integrifolium	water-milfoil	4	
Persicaria decipiens	slender knotweed	4	

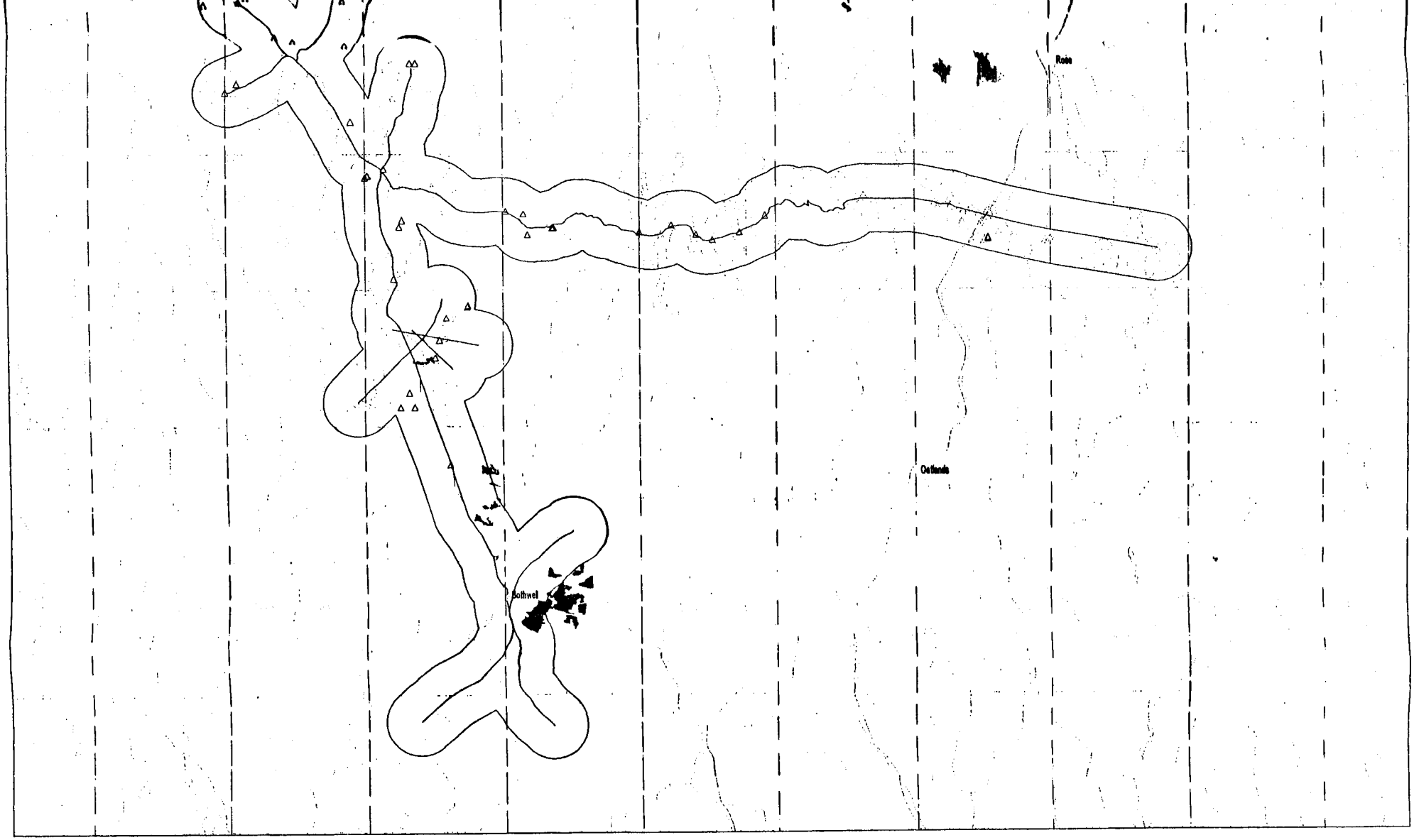
Pilularia novae-hollandiae	austral pilwort	5	
Pimelea curviflora gracilis	slender curved rice-flower	5	
Pimelea pauciflora	poison rice-flower or pimelea	5	
Poa mollis	soft poa grass	5	
Potamogeton pectinatus	fennel pondweed	5	
Prasophyllum correctum	gaping leek orchid		E
Prasophyllum olidum	pungent leek orchid		E
Prasophyllum tunbridgense	tunbridge leek orchid		E
Prostanthera cuneata	alpine mint bush	3.2	
Pterostylis cucullata	leafy greenhood	5	V
Pterostylis squamata	ruddy greenhood	5	
Puccinellia stricta perlaxa	spreading saltmarsh grass	5	
Pultenaea humilis	dwarf bush-pea	4	
Pultenaea prostrata	bush pea	4	
Ranunculus sessiliflorus	small-flowered australian buttercup	5	
Rhodanthe anthemoides	chamomile sunray	5	
Rutidosis multiflora	small wrinklewort	5	
Schoenus latelaminatus	medusa or gimlet bog-rush	3	
Scleranthus diander	knawel	4	
Scleranthus fasciculatus	knawel	4	
Spyridium vexilliferum	winged spyridium	5	
Stackhousia gunnii	gunn's mignonette	3	
Stenanthemum pimeleoides	spreading stenanthemum	4	E
Stipa bigeniculata	rare spear-grass	5	
Stipa nodosa	spear grass	5	
Stipa scabra	rough spear-grass	5	
Thelymitra arenaria	lazy sun orchid	5	

Thelymitra juncifolia	large-spotted sun orchid	5	
Tricoryne elatior	yellow rush-lily	4	
Triptilodiscus pygmaeus	common sunray	4	
Velleia paradoxa	spur velleia	4	
Veronica notabilis	forest speedwell	3.2	
Villarsia exaltata	erect or yellow marsh-flower	5	
Viola cunninghamii	cunningham's violet	5	
Vittadinia cuneata	new holland daisy	5	
Vittadinia muelleri	narrow-leaf new holland daisy	5	
Wilsonia rotundifolia	round-leaf wilsonia	5	
Xanthorrhoea arenaria	grass-tree	4	V

Appendix 4. The proposed location of seismic survey lines, remnant forest vegetation and the distribution of threatened flora records. (Attached).

Threatened Forest Communitied with GTSpot Rare Species and PRFA Candidate Areas





Plotted 12 Jul 01

Scale 1:200000

Threatened Forest Community

TI — Inland Eucalyptus tenuiramis forest

AS — Eucalyptus amygdalina forest on sandstone

OV — Shrubby Eucalyptus ovata – E. viminalis forest

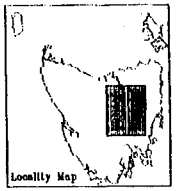
RFA Candidate

RFA Candidate Areas

Rare Species

△ Rare and Threatened Animals (Point Observations)

Rare and Threatened Plants (Point Observations)



APPENDIX 5. THE FINAL LOCATION OF SEISMIC SURVEY LINES.

TB-01 SEISMIC SURVEY